Maii 18. *P. M.*

Diſtantia Meridiana Solis a Vertice 30° 04′.

1 31 53 Limbus præcedens Veneris Meridian. tranſit. Centro diſtant a Vertice 25° 57′ 15″.

Mercurium culminantem neque hac die videre licuit, cœlo licet admodum ſereno.

N. B. Diſtantiæ a vertice a refractionibus non purgantur.

Vide Fig. 2. *in* TAB.

XIII. *The Uſe of a new* Azimuth Compaſs *for finding the* Variation *of the* Compaſs *or* Magnetic Needle *at Sea, with greater Eaſe and Exactneſs than by any ever yet contriv'd for that Purpoſe*; *by Captain* Chriſtopher Middleton, F. R. S.

TO diſcover the Declination of the Magnetic Needle, or Variation of the Compaſs at Sea, with ſome tolerable Degree of Certainty and Exactneſs, is a thing of great Uſe and Importance in the Art of Navigation.

The Inſtruments and Methods hitherto uſed for this Purpoſe, (as we could eaſily demonſtrate, if it were needful) are ſubject to ſeveral Inconveniencies, Errors and Defects; to remedy which, this new *Azimuth Com-*

Compaſs was contriv'd, and has by Experience been found effectual. It would be needleſs to give a Deſcription to ſuch as have the Inſtrument before them, and we ſhall therefore only ſhew the Manner of uſing it, and that as briefly as may be, which take as follows:

1*ſt*, The Inſtrument muſt be rectified, or fitted for Obſervation, by turning it about till the four Cardinal Points, that are hung upon the Centre-pin, agree with the four Cardinal Points on the Chart, at the Bottom of the Box: Then will the Needle, that ſhews the Magnetic Meridian, ſtand at no Degrees, and the Eaſt and Weſt Points at 90 Degrees, on the graduated Circle within the Box; and in this Situation it muſt be kept, as near as may be, during the whole time of the Obſervation.

2*dly*, Let the Index of the Quadrant be placed to that Degree of the Arch, on the Rim of the Box, which the Obſerver judges to be nearly equal to the Height of the Sun or Star whoſe *Azimuth* is ſought; for by this means the Object will be more readily found.

3*dly*, Turn the Quadrant round towards the Sun or Star, till it appear upon the vertical Hair within the Teleſcope, to an Eye looking through the ſmall Hole or Sight; and then ſlide the Index a little upward or downward on the Arch, till the Object by this means be brought to coincide or touch the viſible Horizon.

Laſtly, The Degrees and Minutes then mark'd by the Index upon the Arch of the Quadrant, will ſhew the Altitude of the Object, which will always be the ſame, whether the Inſtrument is in Motion or at Reſt; at the ſame time the Degree cut by the Index on the ho-

horizontal Rim or Circumference of the Compaſs-box, will give the magnetical *Azimuth* of the Sun or Star.

N. B. All this may be perform'd by one Perſon, whereas the old Compaſs requires ſeveral to manage it, which alſo makes it ſubject to many great Errors.

How the Variation of the Needle is found by means of Magnetical *Azimuth* and Altitude thus obtain'd, is taught in every Treatiſe of Navigation, and we have no need to repeat theſe Rules in this Place. But as the Reſolution of this Problem is ſomewhat troubleſome, and requires ſuch a Knowledge of the Doctrine of the Sphere, as every Seaman has not attain'd, we ſhall here exhibit an eaſy Method of diſcovering the Variation of the Compaſs without any manner of Calculation, which cannot fail to render this Inſtrument ſtill more acceptable: To this End,

1*ſt*, Let the Magnetic *Azimuth* of the Sun (or any Star, when it is near the prime Vertical, and conſiderably elevated above the Horizon) be found according to the Directions already given, before it arrive at the Meridian, and note well the Altitude, or let the Index remain fix'd at the ſame Point on the Arch.

2*dly*, Find the Magnetic *Azimuth* of the Sun or Star in like manner as before, when it is exactly at the ſame Degree of Altitude, after it has paſs'd the Meridian: And,

3*dly*, If theſe two Magnetical *Azimuths* are equal, the Needle has no Variation: If unequal, add them together, and half their Sum will be the true *Azimuth*; or ſubtract the leſs from the greater, and half the Difference will be the Variation required. The

Cir-

Circumſtances of the Obſervation will the more readily diſcover whether the Declination is Eaſterly or Weſterly.

N. B. Though it would be very commendable in Gentlemen who uſe the Sea, to learn the Names of moſt of the principal Fix'd Stars, yet even that Knowledge is not neceſſary in the Uſe of this Inſtrument: Neither is it needful in this Caſe to know exactly the Latitude of the Place of Obſervation, provided the Difference of Latitude between the Obſervations be not very great: It is ſufficient, that Care be taken to obſerve the ſelf-ſame Star, before it comes to the Meridian, and after it has paſs'd it; and for the ſake of greater Exactneſs, the Caution before given ſhould be regarded, to wit, That the Star be at ſome conſiderable Height above the Horizon, and alſo near the prime Vertical.

XIV. *An Account of a Book preſented to the* Royal Society, *and intituled,* Notitia Hungariæ novæ Hiſtorico-Geographica, *&c. Auctore* Matth. Belio. *By the Reverend* Zachary Pearce, *D. D.* F. R. S. *&c.*

THE Author of this Work is the Reverend *Matthias Bell,* a Paſtor among the *Lutherans* at *Presburg* in *Hungary*. About twelve Years ago he publiſh'd an Account of what he intended to execute; and by the Encouragement of his preſent Imperial Majeſty, and ſome of the Nobility, he went on